

# Algebroz

## Algebra Workshop

1. Simplify  $(5x + 4y)^2 + (5x - 4y)^2$  [AMCAT 2023]

A.  $32x^2 + 50y^2$

B.  $50x^2 + 32y^2$

C.  $-80xy$

D.  $80xy$

2.  $(\sqrt{21} + \sqrt{10})^2 + (\sqrt{21} - \sqrt{10})^2 = ?$  [MERCER METTL 2023]

A. 22

B. 62

C. 50

D. 31

If  $x + 1/x = \sqrt{2}$  then  $x^4 + 1 = 0$  or  $x^4 = -1$

$$x^2 + 1/x^2 = (\sqrt{2})^2 - 2 = 0$$

$$x^4 + 1/x^2 = 0$$

$$x^4 + 1 = 0 \text{ or } x^4 = -1$$

3. If  $x + 1/x = \sqrt{2}$  then find  $x^{23} + x^{19} + x^{17} + x^{13} + x^4 + 5$

[ELITMUS 2022]

- A. 1
- B. 2
- C. 3
- D. 4

If  $x + 1/x = \sqrt{2}$ , then find: **[MERCER METTL 2023]**

(i)  $x^{23} + x^{19} + x^{17} + x^3 + x^4 + 5$

If  $x^{12.5} + 1/x^{12.5} = 16$ , then  $x^{25} + 1/x^{25} = ?$  [MORGAN STANLEY 2023]

- a)254      b)258      c)260      d)256

If  $x^{42} + 1/x^{21} = 7$ , then  $x^{84} + 1/x^{42} = ?$

[MERCER METTL 2023]

a)51 b)49 c)53 d)47



If  $x - 5\sqrt{x - 1} = 0$ , then  $x^2 + 1 / x^2$  is equal to:

[JP MORGAN 2023]

a) 625 b) 731 c) 729 d) 727

If  $5x + \frac{1}{3x} = 4$ , then what is the value of  $9x^2 + \frac{1}{25}x^2$  ?

[MICROSOFT 2023]

a)  $\frac{174}{125}$  b)  $\frac{144}{125}$  c)  $\frac{114}{25}$  d)  $\frac{119}{25}$

$$\text{If } x + 1/x = 2, \text{ then } x = 1$$

$$\text{If } x + 1/x = -2, \text{ then } x = -1$$

$$\text{If } x + 1/x = 1, \text{ then } x^3 = -1$$

$$\text{If } x + 1/x = -1, \text{ then } x^3 = 1$$

$$\text{If } x + 1/x = \sqrt{2} \text{ then } x^4 = -1$$

$$\text{If } x + 1/x = \sqrt{3} \text{ then } x^6 = -1$$

If  $a^3 - b^3 = 602$  &  $a - b = 2$ , then find the value of  $a^2 + b^2$ .

[IB ACIO Grade 2 – 2024]

A. 156

B. 240

C. 202

D. 260

If  $a^3 - b^3 = 448$  &  $a - b = 4$ , then find the value of  $a^2 + b^2$ .

[MERCER METTL 2023]

A. 80

B. 74

C. 65

D. 78

If  $x^{10} = 5$  &  $\frac{x^9}{y} = 5555$  then find  $\frac{1}{xy} = ?$  [AMCAT 2021]

A. 1111

B. 2525

C. 5

D. 5555

If  $x^{10} = 7$  &  $\frac{x^9}{y} = 77777$  then find  $\frac{1}{xy} = ?$  [ZSCALER 2022]

A. 11111

B. 75757

C. 7777

D. 99999

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)[(a + b + c)^2 - 3(ab + bc + ca)]$$

$$= \frac{1}{2} [(a + b + c) [3(a^2 + b^2 + c^2) - (a + b + c)^2]]$$

$$= [(a + b + c) [(a^2 + b^2 + c^2 - ab - bc - ca)]]$$

$$= \frac{1}{2} [(a + b + c) [(a - b)^2 + (b - c)^2 + (c - a)^2]]$$



If  $a + b + c = 11$  and  $ab + bc + ca = 28$ , then find the value of  $a^3 + b^3 + c^3 - 3abc$  [IBM 2022]

A. 1639

B. 407

C. 2255

D. 1093

If  $x + y + z = 7$  and  $xy + yz + zx = 8$ , then find the value of  $x^3 + y^3 + z^3 - 3xyz$  [TCS 2023]

- A. 200
- B. 150
- C. 125
- D. 175

If  $a + b + c = 8$  and  $ab + bc + ca = 13$ , then find the value of  $a^3 + b^3 + c^3 - 3abc$  [AMCAT 2023]

- A. 200
- B. 302
- C. 255
- D. 750

If  $a + b + c = 7$  and  $a^3 + b^3 + c^3 - 3abc = 175$  find the value of  $ab + bc + ca = ?$  [COCUBES 2023]

- A. 7
- B. 8
- C. 6
- D. 9

If  $a + b + c = 5$  and  $a^3 + b^3 + c^3 - 3abc = 185$  find the value of  $ab + bc + ca$  lies between ? [WIPRO 2022]

- A. 5 and 9
- B. -3 and 1
- C. 1 and 5
- D. -7 and -3

If  $a + b + c = 5$ ,  $a^2 + b^2 + c^2 = 27$ , and  $a^3 + b^3 + c^3 = 125$  then the value of  $\frac{abc}{5}$  [ADOBE 2023]

- A. -1
- B. 5
- C. -5
- D. 1

If  $x + y + z = 7$ ,  $x^2 + y^2 + z^2 = 85$ , and  $x^3 + y^3 + z^3 = 913$  then the value of  $\sqrt[3]{xyz}$  is : **[AMAZON 2023]**

A. 4

B. 2

C. 1

D. 8

If  $\sqrt{x} + \frac{1}{\sqrt{x}} = 6$ , then  $x\sqrt{x} + \frac{1}{x\sqrt{x}} = ?$  [HCL 2023]

A. 198

B. 234

C. 134

D.  $6\sqrt{6}$



If  $\sqrt{x} + \frac{1}{\sqrt{x}} = 11$ ,  $x > 0$ , then  $x\sqrt{x}(x\sqrt{x} - 1298) + 11 = ?$

[OPTUM 2023]

- A. 10
- B. 12
- C. 11
- D. 8

$$\text{If } x + \frac{1}{y} = a, y + \frac{1}{z} = b, z + \frac{1}{x} = c$$

$$\text{Then } xyz - \frac{1}{xyz} = abc - (a + b + c)$$

If  $x + \frac{1}{y} = 4$ ,  $y + \frac{1}{z} = 1$ ,  $z + \frac{1}{x} = \frac{7}{3}$ , then find the value of  $xyz$ .

[SYNGENE 2023]

A.  $\frac{2}{3}$

B.  $\frac{4}{3}$

C. 1

D. 2

If  $xyz = 1$ ,  $x + \frac{1}{y} = 5$  and  $y + \frac{1}{z} = 29$ , then find the value of

$z + \frac{1}{z} = ?$  [HAVELLS 2023]

- A.  $\frac{1}{2}$
- B.  $\frac{1}{4}$
- C.  $\frac{1}{6}$
- D.  $\frac{2}{7}$

If  $a + b + c = 3abc$ , then two cases are possible

1.  $a + b + c = 0$

2.  $a = b = c$

If  $a + b + c \neq 0$ ,  $a^3 + b^3 + c^3 = 36$ ,  $abc = 12$ , then find the value of  $(a + b)(b + c)(c + a)$ ? [MRF 2023]

- A. 52
- B. 96
- C. 32
- D. 24

$$\text{If } (4x - 3)^2 + (2x + 5)^2 + (5x - 7)^2 = (4x - 3)(2x + 5)(5x - 7)$$

and  $x \neq \frac{5}{11}$ , then  $x = ?$  [KPMG 2023]

A. 3

B. 4

C.  $\frac{11}{5}$

D. -5

If  $a, b, c$  are non-zero real numbers such that  $a + b + c = 0$ , then what are the roots of the equation  $ax^2 + bx + c = 0$ ?

[CDS 2023, NDA 2022]

A.  $2, 1 + \frac{c}{a}$

B.  $1, \frac{a}{c}$

C.  $1, \frac{c}{a}$

D.  $2, \frac{c}{a} - 1$



If  $2^x = 3^y$  &  $\frac{2}{x} + \frac{3}{y} = 1$ , then find  $2^x + 3^y = ?$  [GODREJ 2023]

A. 108

B. 168

C. 216

D. 225

If  $3\sqrt[3]{x} + 4\sqrt[3]{x} = 5\sqrt[3]{x}$  then what is the value of x? [ITC 2023]

A. 8

B. 2

C. 4

D. 1

If  $16^{\sqrt{x}} + 63^{\sqrt{x}} = 65^{\sqrt{x}}$  then what is the value of  $x$ ?

[COLGATE PALMOLIVE 2023]

- A. 4
- B. 2
- C. 4
- D. 1

If  $12^{\sqrt{x}} + 16^{\sqrt{x}} + 21^{\sqrt{x}} = 29^{\sqrt{x}}$  then what is the value of  $x$ ?

[FLIPKART 2023]

- A. 4
- B. 3
- C. 16
- D. 2

If  $(a + b + c) = 0$  and  $(abc) = 12$ , then what is the value of  $a^3 + b^3 + c^3$  [BYJUS 2023]

- A. 12
- B. 36
- C. 72
- D. 6

If  $a + b + c = 0$ , then

$$a^3 + b^3 + c^3 = 3abc$$

If  $p + q = r$ ;  $pqr = -36$  then find  $p^3 + q^3 - r^3$  [TAVISCA 2023]

- A. 72
- B. 105
- C. 0
- D. 108

If  $a, b, c$  are all non-zero real numbers and  $a + b + c = 0$ , find the value of  $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab}$ . [BOSCH 2023]

A. 3

B. 4

C. 1

D.  $\frac{1}{2}$



If  $2x - y + 3z = 0$ , then find the value of

$$\frac{4x^2}{yz} - \frac{y^2}{2xz} + \frac{27z^2}{2xy} . \text{ [VMWARE 2023]}$$

A.  $-9$

B.  $18$

C.  $-3$

D.  $9$